

Appl. No. 09/935,465

REMARKS

Claims 32-48 are pending in the application.

Claims 32-48 stand rejected under 35 USC 103(a) as being unpatentable over Qian. Applicant requests reconsideration.

Claim 32 sets forth a method that includes, among other features, cleaning an accumulated deposition from a vaporization surface of a vapor forming device by using the vaporization surface as an electrode to form a plasma within the device. Pages 2-3 of the Office Action acknowledge that Qian fails to specifically teach cleaning an accumulated deposition from a vaporization surface. Nevertheless, the Office Action alleges that Qian teaches cleaning an etch residue with a plasma and that it would be obvious for any other contaminant to be removed in a similar manner including an accumulated deposition from a vaporization surface. Applicant traverses.

Review of Qian reveals that such reference pertains only to a process and apparatus for etching a substrate in an etching chamber. Qian does not disclose or suggest forming a vapor or a vapor forming device. The normal functioning of the process and apparatus described by Qian instead includes forming a plasma in the etching chamber. Accordingly, the Qian teaching of using a wall of the process chamber as a first electrode 120 does not alter the normal functioning of the Qian process and apparatus. Qian merely changes a location of an electrode within the device.

In contrast, the normal functioning of a vapor forming device, such as set forth in claim 32, does not include forming plasma in the device. Accordingly, a method that includes using a vaporization surface of the vapor forming device as an electrode to

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form a plasma within the device alters the normal functioning of the vapor forming device. The change in a vapor forming device to accomplish the claimed method is much more significant than merely changing the location of an electrode in an etching chamber, as in Qian. Qian does not in any way disclose or suggest that the normal functioning of the described etching process or apparatus should be altered in like manner. At least for such reason, Applicant asserts that Qian cannot be considered to disclose or suggest every limitation of the method set forth in claim 32.

Additional review of Qian reveals that the need for cleaning the Qian etching chamber arises from generation of a thin, non-homogeneous etch residue deposited on components of the etching chamber during etching. The Qian process involves supplying both an etchant gas and a cleaning gas during the etching process to remove etch residue deposited by the etchant gas. In contrast, the accumulated deposition on the vaporization surface set forth in claim 32 is not generated by an etchant gas during an etching process.

As indicated above, the normal functioning of a vapor forming device does not include etching or use of an etchant gas. Qian does not disclose or suggest and the Office Action does not identify any reference to column and line numbers suggesting that the cleaning gas feature of the Qian process applies to residues other than etch residue deposited by etchant gas. Applicant asserts that those of ordinary skill would not necessarily conclude that the Qian cleaning gas feature is applicable to cleaning an accumulated deposition from a vaporization surface of a vapor forming device, as set forth in claim 32. Accordingly, no motivation exists to modify Qian by applying its

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etching process to a vapor forming device. At least for such additional reason, Qian fails to disclose or suggest every limitation of claim 32.

Applicants note that the Federal Circuit has determined that the problem confronted by the inventor must be considered in determining whether it would have been obvious to modify references in order to solve that problem. Diversitech Corp. v. Century Steps Inc., 7 USPQ2d 1315, 1318 (Fed. Cir. 1988). If the references do not address or even recognize the problem they cannot begin to teach or suggest a solution to it. Qian does not address the problem solved by Applicant's invention and, accordingly, cannot suggest a solution to such problem. The Federal Circuit further stated that "the nature of the problem 'which persisted in the art,' and the inventor's solution, are factors to be considered in determining whether the invention would have been obvious to a person of skill in that art." Northern Telecom v. Datapoint Corp., 15 USPQ2d 1321, 1324 (Fed. Cir. 1990). In Northern Telecom, the Federal Circuit confirmed a finding that the claims were valid in view of prior art that did not "suggest the [inventors'] solution" to a problem. Id. at 1323-24.

Further review of Qian reveals that such reference does not disclose or suggest the problem solved by Applicant's invention of cleaning an accumulated deposition from a vaporization surface of a vapor forming device. As acknowledged by the Office Action, Qian does not suggest the existence of any problem with an accumulated deposition on a vaporization surface of a vapor forming device. Applicant notes that the accumulated deposition is clearly not etching residue. No basis exists for any assumption that a vapor forming device is capable of generating etching residue. Since Qian does not address the problem set forth in claim 32, Qian cannot begin to

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teach or suggest a solution to it. At least for such further reason, Applicant asserts that Qian does not disclose or suggest every limitation of claim 32.

A finding of obviousness requires that Qian disclose or suggest every limitation. Accordingly, claim 32 is patentable over Qian. Claims 33-37 depend from claim 32 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. For example, each of claims 33-35 set forth alternative configurations for application of RF energy. The Office Action does not allege that Qian discloses or suggests any of the claimed configurations with reference to column and line numbers in Qian.

Claim 38 sets forth a method that includes, among other features, cleaning a vaporization surface having deposits accumulated from use in a vapor forming device. The method includes using the vaporization surface as an electrode to form a plasma within the device and cleaning at least some of the deposits from the vaporization surface. As may be appreciated from the discussion above regarding the deficiencies of Qian as applied to claim 32, Qian does not disclose or suggest every limitation of claim 38. At least for such reason, claim 38 is patentable over Qian. Claims 39-41 depend from claim 38 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. For example, each of claims 39-41 set forth alternative configurations for application of RF energy. Qian does not disclose or suggest any of the configurations set forth in claims 39-41.

Claim 42 sets forth a method that includes, among other features, flowing at least one liquid across a vaporization surface to form a vapor, accumulating a deposition on the vaporization surface, and using the vaporization surface as an

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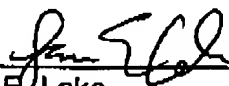
electrode to form a plasma cleaning at least some of the deposition from the vaporization surface. As may be understood from the discussion above regarding the deficiencies of Qian as applied to claim 32, Qian does not disclose or suggest every element of claim 42.

Applicant further notes that claim 42 sets forth flowing at least one liquid across a vaporization surface to form a vapor. Qian does not disclose or suggest flowing liquid across a vaporization surface to form a vapor nor the resulting problem of accumulating a deposition on the vaporization surface as a vapor is formed therefrom. Instead, as indicated above, Qian pertains only to plasma etching and etch residue deposited from etchant gas. The claimed method clearly does not produce etch residue from plasma etching and Qian does not motivate or suggest application of the Qian process to a vapor forming device. Accordingly, Qian further does not disclose or suggest every element of claim 42. Claim 42 is thus patentable over Qian. Claims 43-48 depend from claim 42 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested. For example, each of claims 46-48 set forth alternative configurations for applying RF energy. Qian does not disclose or suggest the subject matter of claims 46-48

Applicant herein sets forth adequate reasons to establish patentability of all pending claims 32-48 and requests allowance of such claims in the next Office Action.

Respectfully submitted,

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